U.S. Fish & Wildlife Service

Saving Our Scrub

A newsletter dedicated to sharing information about the Florida scrub ecosystem

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Inside This Issue:

Effects of Mechanical Treatments on Florida Scrub

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Most Saving Our Scrub readers are by now familiar with the many benefits of prescribed fire to Florida scrub. Most land managers are familiar with the difficulties of prescribing fire, such as changing weather, timing, or avoiding impacts to nearby property. Homeowners can be resistant to prescribed burns adjacent to their property, for fear of the fire's escape. However, without fire, fuels build-up, posing increasing threats to people and property. Mechanical treatments such as logging, mowing, and roller chopping are being used across Florida as alternatives to burning or in combination with burning. Few studies have been done in Florida scrub (and fewer on the Lake Wales Ridge) to determine how these mechanical treatments affect fire intensity, vegetation dynamics, and population viability of endangered and threatened species.

Despite the increasing application of mechanical treatments, we still don't have a good answer to the key question: **Are mechanical treatments a good way to get the ecological benefits of fire without the risks, or will they cause unintended harmful effects to vegetation and rare species?**

The Archbold Biological Station Plant Lab has three ongoing studies on fire and mechanical treatments: "Log and Burn," "Mow and Burn," and "Saw and Burn." The Log and Burn project takes place at the Lake Wales Ridge Forest, Arbuckle Tract. The Mow and Burn project occurs on two Florida Fish and Wildlife Conservation Commission sites, Lake Placid and Lake Apthorpe Scrubs. The Saw and Burn project is being done at the Lake Wales Ridge National Wildlife Refuge, Carter Creek South Tract. These projects share the common goal of evaluating mechanical treatments as either surrogates or pre-treatments for fire. All research sites support many listed endemic plant species.

Our approach is to combine mechanical treatment and fire in four combinations, collect detailed pre-treatment data, and contrast treatment effects for five years. Our emphasis is on evaluating each mechanical treatment, both as surrogate and pre-treatment, in relation to fire-only.

Arbuckle Tract "Log and Burn" project in 1999.

Log and Burn

In oak-rosemary scrub, we placed randomly-located research plots in each of four treatment blocks (log only, burn only, log and burn, and control). We have completed pre-treatment and 1 and 2 years post-treatment sampling. All treatments were successful in removing the tree and subcanopy layers and reducing shrub cover. Bare sand levels were quite high, especially in logged areas used for skidding. Initial results suggest that logging treatments created initially higher levels of some native weedy species than the burn-only treatment. There has been little recruitment of listed species, perhaps due to dry weather in 1999-2001.

Mow and Burn

This project uses four experimental treatments: control, mow only, burn only, and mow and burn. The sites were dominated by oak-rosemary scrub and were sampled with belt transects within 1-ha treatment areas. Lake Apthorpe was mowed and burned in the same year (1999); however Lake Placid was mowed in 2000 but could not be burned until 2001 because of weather conditions. We have completed pre-treatment and 1 and 2 years post-treatment sampling. After two years, we have seen strong treatment effects at both

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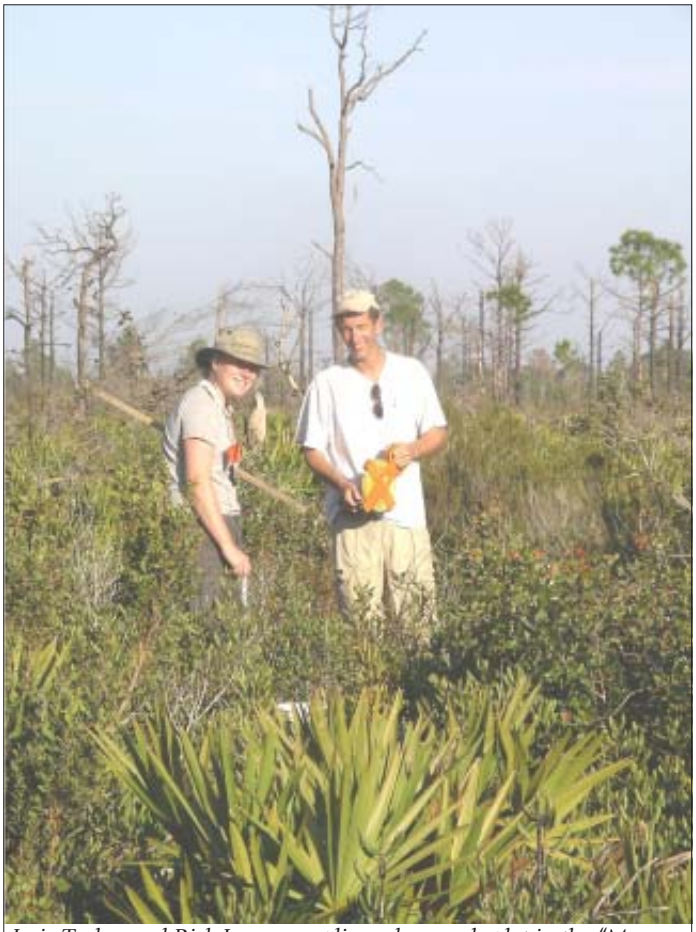

Josie Tucker and Rick Lavoy sampling a burn only plot in the "Mow and Burn" project at Lake Placid Scrub, November 2003.

Eric Menges sampling a burn only plot in the "Mow and Burn" project at Lake Placid Scrub, November 2003.

sites. All treatments were effective in reducing shrub heights relative to the control. Increases in bare sand, important to many listed species, occurred only in the burn only treatment at Lake Placid, where burning took place a year after mowing. Bare sand increased in the burn only and mow and burn at Lake Apthorpe. Densities of *Paronychia chartacea* increased only in the burn only treatment, although the increase was highly variable.

Saw and Burn

Three treatments were applied (burn only, sub-canopy felling followed by burning [saw and burn], and a control), each with twenty-four replicates. We have sampled the plots annually since 2001. Eleven of 24 community plots within the burn-only treatment that did not burn were excluded from post-burn surveys. Data from this project is currently being analyzed for differences among treatments over time.

Conclusions

Our preliminary data suggest that mechanical treatments alone do not have the same effects as fire and should be avoided. Mechanical treatments used as a pre-treatment or in addition to fire can mimic some of the effects of fire, especially if burning closely follows the mechanical treatment. All projects will be re-sampled 5 years after treatment, and at that time we will be able to make strong conclusions about using mechanical treatments. Managers must know if mechanical treatments alone can mimic the effects of burning for scrub plants, or if they must be done in tandem with burning, or if the effects of mechanical treatments with or without burning will be different than burning alone.

Thanks to the Division of Forestry, Florida Fish and Wildlife Conservation Commission, The Nature Conservancy, and the U.S. Fish and Wildlife Service for cooperation on these projects.

Arboreal Frog Fauna of a Coastal Scrub Oak Community

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Recently I published a paper validating a PVC pipe technique for studying treefrogs*. This experiment took place in a coastal oak scrub community, even though this habitat type is not generally known for its diverse arboreal frog fauna. For over three consecutive years, tree frogs were studied/monitored by mark-recapture. Species found include *Hyla cinerea*, *H. femoralis*, *H. squirella*, and *Osteopilus septentrionalis*. In fact, according to species descriptions, none of these are known to occur in oak scrub. These frogs appear to be relatively abundant in a coastal scrub, but numbers vary greatly in space and time. Species abundant one year almost disappear the next. Fire appears to be one factor contributing to this variation, but more replicate fires are needed to be more certain.

Another paper I just submitted examined postmetamorphic growth, age to sexual maturity, and longevity of these same species of treefrogs. Treefrogs spend the majority of their lives in terrestrial habitats, with adults only briefly moving to and from ephemeral pools during the breeding season. This study found that adults reach maturity within 6 to 13 months of metamorphosis, depending on size at transformation, and participate in the next season's breeding. Age and body size data fit the Bertalanffy growth model well in all species. The average growth rate for *H. femoralis* was significantly less than that of other species studied. Intraspecific differences were independent of time of year, except for *O. septentrionalis* (an introduced tropical species) which had a significantly greater growth rate during the wet season. Juveniles grow rapidly, but once breeding size is reached, growth is relatively slow, and evidently few individuals survive more than 3 breeding seasons at the study site. I am currently working on data analysis for population models. To better understand variation in growth rates, identifying the potential interspecific, seasonal, and ontogenetic changes in diet composition, and prey selectivity is a next step for research.

* Bartareau, T. 2004. PVC pipe size influences the species and sizes of treefrogs captured in a Florida coastal oak scrub community. Herpetological Review 35(2):150-152.

The study site

Four different sizes of PVC pipe were used in the experiment

Checking a pipe for frogs

Meetings, Etc.

Working Across Boundaries to Protect Ecosystems February 1-3, 2005. TNC's Natural Areas Training Academy Workshop, Camp Kalaqua, High Springs, FL. Register online at *nata.snre.ufl.edu* or contact Peter Colverson, *pcolverson@tnc.org.*

Vegetation Monitoring in a Management Context February 21-26, 2005. TNC's Natural Areas Training Academy Workshop, Archbold Biological Station, Lake Placid, FL. Register online at *nata.snre.ufl.edu* or contact Peter Colverson, *pcolverson@tnc.org*.

Applying Technology to Management March 1-3, 2005. TNC's Natural Areas Training Academy Workshop, Crystal River Preserve State Park, Crystal River, FL. Register online at *nata.snre.ufl.edu* or contact Peter Colverson, *pcolverson@tnc.org*.

North American Wildlife and Natural Resource Conference March 16-20, 2005, Crystal Gateway Marriott, Crystal City, VA. "Elevating the Priority of Natural Resource Conservation." For more information, ctact Richard McCabe, by phone, at 202-371-1808.

Restoration Planning and Techniques for Forest Lands April 5-7, 2005. TNC's Natural Areas Training Academy Workshop, location to be determined. Register online at *nata.snre.ufl.edu* or contact Peter Colverson, *pcolverson@tnc.org*.

Managing Visitors and Volunteers in Natural Areas May 3-5, 2005. TNC's Natural Areas Training Academy Workshop, Disney Wilderness Preserve, Kissimmee, FL. Register online at *nata.snre.ufl.edu* or contact Peter Colverson, *pcolverson@tnc.org*.

Florida Native Plant Society May 12-15, 2005, hosted by the Conradina Chapter in Melbourne, FL. Visit *www.fnps.org*.

American Association of Mammalogists June 15-19, 2005, Southwest Missouri State University, Springfield, MO. See *asm.smsu.edu*.

Society for Conservation Biology July 15-19, 2005, Universidade de Brasilia, Brasilia, Brazil. "Conservation Biology Capacity Building & Practice in a Globalizing World." See *www.scb2005.unb.br.*

Ecological Society of America/IX International Congress of Ecology August 7-12, 2005, Montreal, Canada. "Ecology at Multiple Scales." See *www.esa.org/montreal.*

American Ornithologists' Union/ Society of Canadian Ornithologists August 23-27, 2005, University of California, Santa Barbara, CA. See *www.aou.org/meetings/index.php3*.

Society for Ecological Restoration September 13-16, 2005, Zaragoza, Spain. See *www.ecologicalrestoration.net.*

2005 Natural Areas Conference September 21-24, 2005, Lincoln, Nebraska. "Changing Natural Areas:Ecological and Human Dimensions." See *www.unl.edu/plains/events/2005/overview.htm.*

Association of Southeastern Biologists April 13-15, 2005, Florence, AL. See *www.asb.appstate.edu/.*

Misc. Training in a wide variety of topics, including (but not limited to) conservation biology, permitting, and partnership building is available at U.S. Fish and Wildlife Service's National Conservation Training Center, based in Shepardstown, WV. For additional information see their web site at *training.fws.gov.*

Saving Our Scrub *is published regularly to provide a forum for sharing information about the imperiled Florida scrub ecosystem. The newsletter is distributed free to anyone interested in obtaining a copy. Comments, suggestions, and article submissions should be directed to the editor. The editor and the U.S. Fish and Wildlife Service assume no responsibility for information contained herein, or for injury or damage resulting from use of such information. Information herein will be used at the reader's own discretion and risk. Views and opinions expressed herein are those of the author or source of material and do not necessarily reflect the opinions, views, or endorsements of the U.S. Fish and Wildlife Service.*

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Website:
http://northflorida.fws.gov

Your article goes here!

Newsletter Needs:

- ❑ Articles from folks who are on the ground performing restoration and management tasks vital to the ecosystem. These articles should be about management and restoration techniques AND how you have dealt with the public when performing these tasks. Without your successes and/or failures being reported, others may waste valuable time learning what you already know.
- ❑ Articles on dispersal of scrub wildlife and how to manage to encourage dispersal among sites
- ❑ Articles on the biology of all scrub endemics
- ❑ Information about seminars, meetings, workshops, and field trips relating to scrub or scrub management
- ❑ Notes about unusual observations in the scrub
- ❑ Information about funding opportunities
- ❑ Submissions regarding conservation techniques other than land purchase, such as inheritance tax changes, conservation easements, etc.
- ❑ Information on pending state legislation
- ❑ Articles on successful partnerships
- ❑ Plant identification tips
- ❑ Citations for new journal articles or grey literature about scrub
- ❑ Information on anything else about scrub that you think the readers would find interesting

The editor is seeking unique scrub pictures to place in each newsletter at this location. Your photo (or drawing) could be anything scrub-related (e.g. general habitat shots, shots of flora or fauna, management activity, etc.). Please submit any photos and captions via email to *dawn_zattau@fws.gov* or mail a print, negative, or slide to *Dawn Zattau, U.S. Fish and Wildlife Service, 6620 Southpoint Dr. S., Ste. 310, Jacksonville, FL 32216*. I promise to return the original to you as soon as I have scanned the image!

Juvenile scrub-jay, Charlotte County (photo courtesy of Michelle Kinard)

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Address Correction Requested